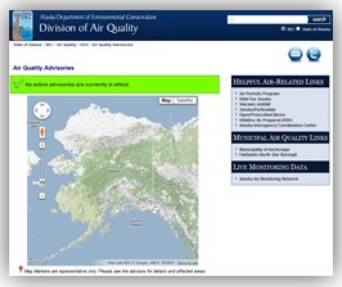
Alaska Products & Tools: Quick Reference Guide

Use this quick list to find a short description and web access to the tools you need.

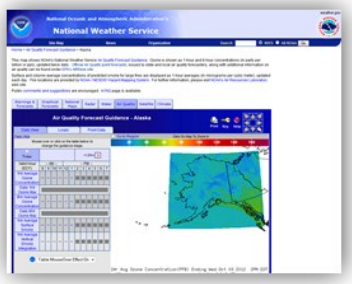
Air Quality



Dept. of Environmental Conservation Air Quality Advisories

The DEC provides access to current air quality advisories in a map display and a complete list of advisories (filterable by area and year). Links to several other air-related web sites (e.g., wildfire smoke, open/prescribed burns, and others) are also provided.

Location: http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories/



National Weather Service Experimental Air Quality Forecast

Surface and column-average concentrations of predicted smoke for large fires are displayed as 1-hour averages (in micrograms per cubic meter) and updated each day. Fire locations are provided by NOAA / NESDIS' Hazard Mapping System. For more information, visit NOAA's Air Resources Laboratory web site.

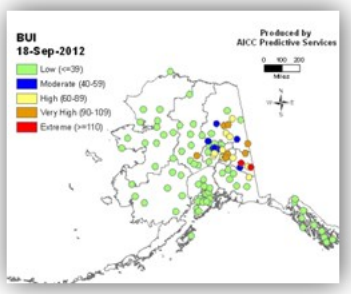
Location: http://airquality.weather.gov/sectors/alaska.php

UAF Smoke: Wildfire Smoke Prediction for Alaska

The Weather Research and Forecasting model with Chemistry and fire plume rise dynamics (WRF-Chem) is used as a core model to forecast the atmospheric dispersion of smoke downstream from Alaska wildfires. Forecasts for up to 72 hours of PM2.5, PM10 and black carbon concentrations are updated daily with current fire and weather information.

Location: http://smoke.arsc.edu *Contact:* Martin Stuefer (stuefer@gi.alaska.edu)

Fire Danger



Forecasted Fire Weather Index Maps

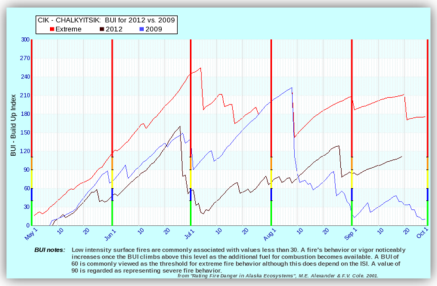
The Alaska Interagency Coordination Center's (AICC) Predictive Services Branch produces the Alaska forecast and actual value maps for the following indices and weather values: Fine Fuel Moisture Code, Duff Moisture Code, Drought Code, Initial Spread Index, Build Up Index, Fire Weather Index, relative humidity (%) and air temperature (°F).

Location: http://fire.ak.blm.gov/predsvcs/fuelfire.php

Fire Weather Index (FWI) Database

This database contains daily weather observations for 1400 AKDT (air temperature, relative humidity, wind speed and precipitation) and the corresponding calculated Fire Weather Indices (Fine Fuel Moisture Code, Duff Moisture Code, Drought Code, Initial Spread Index, Build Up Index, Fire Weather Index and Daily Severity Rating) for each FWI compatible remote weather station in Alaska. Archived data for the current and previous year is available.

Location: http://fire.ak.blm.gov/wx/wxstart.php?src=fwi&disp=geog

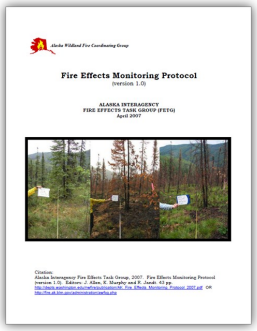


Fire Weather Index Seasonal Tracking Tool (FWIST)

This tool graphically depicts seasonal (May—Sept) Fire Weather Index (or other parameter) values for the selected weather station and year. Users can choose to show a comparison year, daily average values, daily extreme values, and/or fire danger rating thresholds.

Location: http://fire.ak.blm.gov/predsvcs/fuelfire/fwist.php

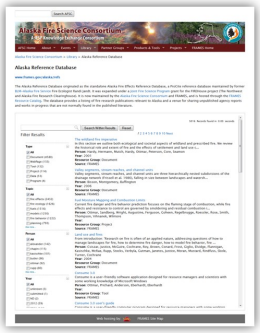
Fire Effects



Alaska Fire Effects Monitoring Protocol

This document provides basic protocols to monitor and inventory Alaska fuels and/or fire effects including detailed descriptions, references, gear lists, field data sheets and other resources. Sampling methods include: photo points, vegetation cover, forest measurements, active layer depths, burn severity, duff/woody fuel loading, and shrub density.

Location: http://www.frames.gov/afsc/frdac/activities



Alaska Reference Database

This searchable database contains publications, presentations, webpages, projects, posters and other documents related to wildfire in Alaska and other boreal ecosystems.

Location: www.frames.gov/alaska/refs

Consume (3.0)

This software predicts the amount of fuel consumption, emissions, and heat release from piled slash and natural fuels based on weather data, fuel moisture, fuel loading, and a number of other factors. Using these predictions, managers can accurately determine when and where to conduct a prescribed burn or aid in fire suppression decisions in achieving desired objectives while reducing impacts on other resources.

Location: http://www.fs.fed.us/pnw/fera/research/smoke/consume/

Consume Fact Sheet | Tutorial | User's Guide

FEAT/FIREMON Integrated (FFI)

FFI is a monitoring software tool designed to assist managers with collection, storage and analysis of ecological information. This database management system was developed to support immediate and long-term monitoring and reporting of fire effects and its use encourages cooperative, interagency information sharing.

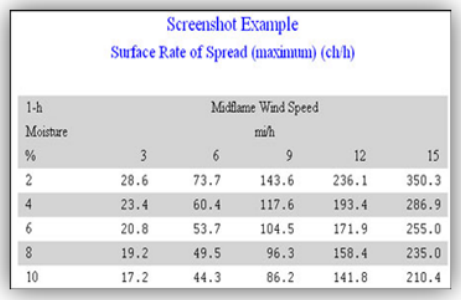
Location: http://www.frames.gov/partner-sites/ffi/ffi-home/

Fire Effects Information System (FEIS)

This system currently provides reviews of more than 1,000 plant taxa (including 170 invasive plants), more than 130 animal taxa, and 8 lichens. FEIS species reviews emphasize fire but also provide extensive information on the taxonomy, distribution, basic biology, ecology, and management of each species. Summaries of fire effects and prescribed fire case studies are also available.

Location: http://www.fs.fed.us/database/feis/

Fire Models


Screenshot Example

Surface Rate of Spread (maximum) (ch/h)

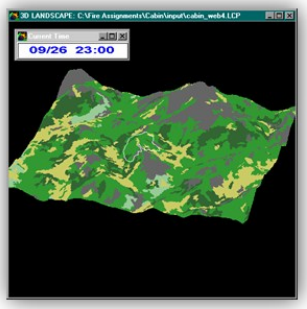
1-h Moisture	Midflame Wind Speed mi/h				
%	3	6	9	12	15
2	28.6	73.7	143.6	236.1	350.3
4	23.4	60.4	117.6	193.4	286.9
6	20.8	53.7	104.5	171.9	255.0
8	19.2	49.5	96.3	158.4	235.0
10	17.2	44.3	86.2	141.8	210.4

BehavePlus

BehavePlus is a PC modeling system that describes fire behavior, fire effects, and the fire environment. It is used for basic fire modeling understanding, prescribed fire planning, fuel hazard assessment, predicting wildfire behavior, etc. Results are in the form of tables, graphs, and simple diagrams.

Location: http://www.firemodels.org/index.php/behaveplus-introduction

BehavePlus: Past, Present, and Future [PDF]

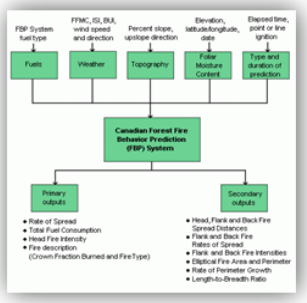


FARSITE

FARSITE is a PC based modeling system that computes fire growth and behavior using changing fuel moisture and weather across a landscape. FARSITE is a spatial fire modeling system.

Location: http://www.firemodels.org/index.php/farsite-introduction/farsite-overview

Publications and Background Information

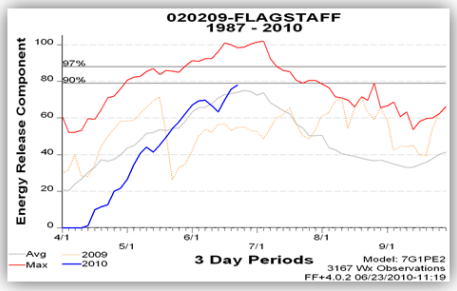


Fire Behavior Prediction (FBP) System

The Canadian Forest Fire Behavior Prediction (FBP) System is a systematic method for assessing wildland fire behavior potential. The system can be accessed by using the Fire Weather and Behavior Field Guide (Red Book) or using computer software (Remsoft). The system provides quantitative estimates of head fire spread rate, fire intensity, type of fire, elliptical fire area, perimeter, and perimeter growth rate.

Background: http://cwfis.cfs.nrcan.gc.ca/en_CA/background/summary/fbp

Field Guide to the FBP System (Red Book)



FireFamilyPlus

This is a PC based program that analyzes and summarizes weather and fire occurrence. It can be used to compute indices and components of NFDRS and CFFDRS from historic weather data and analyze specific weather information to help determine season-ending and/or fire-slowing events.

Location: http://www.firemodels.org/index.php/firefamilyplus-introduction/firefamilyplus-overview

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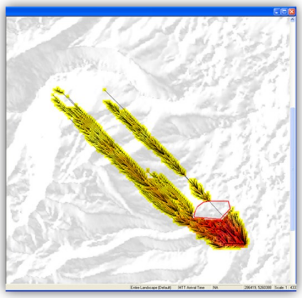
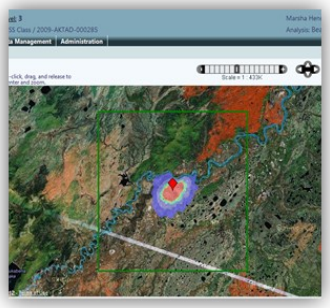


FlamMap

This is a PC based modeling system that describes potential fire behavior characteristics (spread rate, flame length, fireline intensity, crown fire activity, etc.) for a single set of constant weather and fuel moisture conditions across a landscape. Fire behavior calculations are done for each pixel on the landscape.

Location: http://www.firemodels.org/index.php/national-systems/flammap

Publications and Background Information



FSPro

This is a web-based geospatial model that calculates the probability of fire spread from a current fire perimeter or ignition point for a specified time period. It does not project fire size or a fire perimeter. This model uses a GIS landscape from LANDFIRE and a representative RAWS station. FSPro can produce fire probability projections for 7 to 21 days. This model is accessed through the Wildland Fire Decision Support System (WFDSS).

Location: http://wfdss.usgs.gov/wfdss/WFDSS_Home.shtml

FSPro Analysis in Alaska [PDF]

Near-Term Fire Behavior

This is a web-based program that models fire growth in the form of a fire progression (similar to FARSITE). This model uses inputs for weather and wind that change over the duration of the simulation. It is generally appropriate to model fire growth for 1-5 days. This model is accessed through the Wildland Fire Decision Support System (WFDSS).

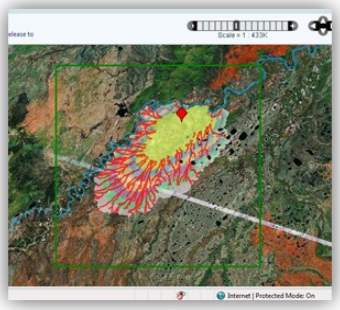
Location: http://wfdss.usgs.gov/wfdss/WFDSS_Home.shtml

Nexus

NEXUS is a software program designed to model crown fire potential (Scott 1999). NEXUS links surface and crown fire models to calculate crown fire hazard within a single stand using fuel models, fuel moisture, canopy fuels, wind and topography as inputs. This program can be used to compare the effects of fuel treatments on crown fire potential.

Location: http://www.fire.org/

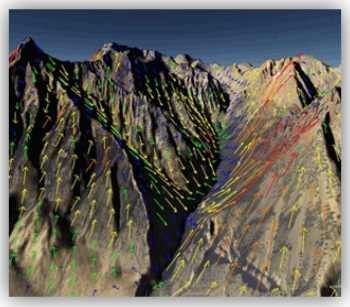
Using Nexus to Access the Effectiveness of Black Spruce Fuel Breaks in Alaska [PDF]



Short-Term Fire Behavior

This is a web-based program that calculates spread rates and maximum spread direction at each cell on the landscape (similar to FlamMap). This model uses one set of wind and fuel moisture conditions and provides potential fire spread for a user-defined length of time. Best used for a short duration, generally 1-3 days. This model is accessed through the Wildland Fire Decision Support System (WFDSS).

Location: http://wfdss.usgs.gov/wfdss/WFDSS_Home.shtml

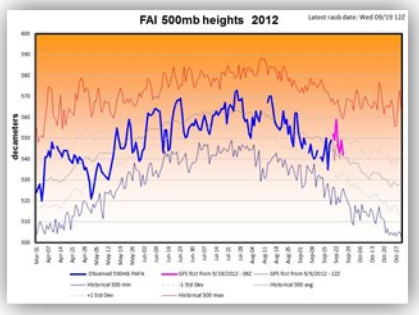


WindNinja

This is a PC based program that computes winds gridded to the topography of the landscape. The program is also used in other programs including FlamMap 5.

Location: http://www.firemodels.org/index.php/windninja-introduction

Fire Weather

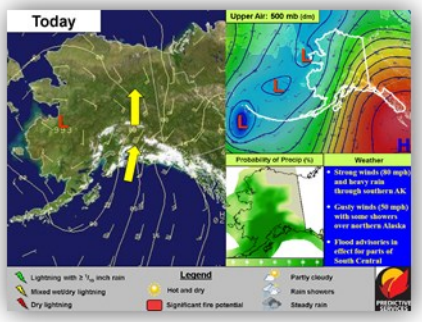


500 mb Graph

This is a graph of the 500 mb heights for the fire season. It includes the forecasted heights for several days into the future along with the historical average, minimum and maximum.

Location: http://fire.ak.blm.gov/content/weather/500mb/PAFAseason.jpg

500 mb Graph Information



Daily Fire Weather Briefing & Podcast

AICC Predictive Services produces a daily statewide fire weather briefing (during fire season) in a downloadable pdf format and as a podcast (slideshow with audio).

PDF: http://fire.ak.blm.gov/content/weather/outlooks/wxbrief.pdf

Podcast: http://fire.ak.blm.gov/content/weather/camtasia/weather briefing.html

Fire Weather Briefing Decoder [PDF] | Alaska Fire Weather Basics [PDF]

RAWS Weather Database

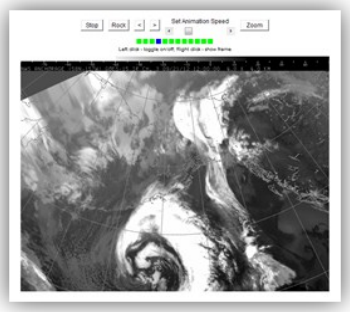
Basic hourly weather data from all reporting remote automated weather stations are available. Users can view individual stations and previous hourly weather data back to 2011.

Location: http://fire.ak.blm.gov/wx/wxstart.php?disp=geog

ROMAN (Real-time Observation Monitor and Analysis Network)

This website provides real-time weather observations for weather stations across Alaska which can include RAWS and NWS stations. This site can also be used to show trend graphs and summaries (e.g., current weather, precipitation, 24-hr trends, 5 day max and mins, fire weather monitor, etc).

Location: http://raws.wrh.noaa.gov/roman/



Satellite Loop

This webpage is produced by the NWS and gives quick access to the current satellite loop for Alaska.

Location: http://www.arh.noaa.gov/satloop.php?sat=goes&sector=4gvf

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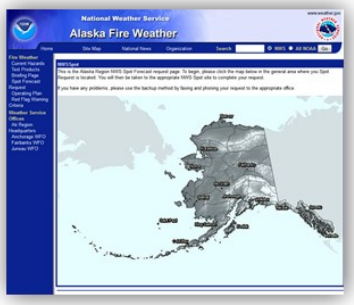


Spot Weather Forecast

Spot weather forecasts can be requested through the National Weather Service for an ongoing incident, planning a prescribed fire, or for burning piles. Completed forecasts are also accessible through the website. Instructions for submitting a request can be found on the AICC—Fire Weather webpage.

Location: http://firewx.arh.noaa.gov/spot.php

Fuels

Alaska Natural Fuel Photo Series

The photo series can be used to quickly estimate forest inventory information such as vegetation composition, tree density, forest floor and overstory biomass, downed woody fuel loading and other site characteristics. Two volume were produced for Alaska: 1) Black Spruce and White Spruce Types; and 2) Hardwoods with Spruce. *Note:* Contact the Alaska Fire Science Consortium for copies.

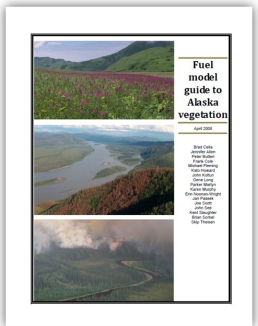
Location: http://www.fs.fed.us/pnw/fera/research/fuels/photo_series/

Digital Photo Series | Fact Sheet | Tutorials

Fuel Characteristic Classification System (FCCS)

This software system can be used to build, characterize, and classify fuelbeds to accurately capture the structural complexity and geographical diversity of fuel components across landscapes and provide the ability to assess elements of human (e.g., logging slash) and natural (e.g., insect and disease) change. The system also calculates a surface fire behavior, crown fire, and available fuel potential index.

Location: http://www.fs.fed.us/pnw/fera/fccs/index.shtml



Fuel Model Guide to Alaska Vegetation

This guide contains fuels and fire behavior information and vegetation characteristics for Alaska. Each general fuel type is associated with photos, the most appropriate fuel models, the primary carrier of fire, fire behavior notes, vegetation characteristics, individual 4th-level Viereck vegetation classes, and fuel types with similar characteristics. This document also contains a crosswalk from vegetation class to various fuel models (e.g., original 13, new 40, and Canadian FBP).

Location: http://fire.ak.blm.gov/content/admin/awfcg/C. Documents/Alaska Fuel Model Guidebook 062008.pdf

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LANDFIRE—Fuels

LANDFIRE is an interagency vegetation, fire, and fuel characteristics mapping program. Alaska uses the LANDFIRE version 2008 LF1.1.0. The data includes fuel models (13 Anderson, 40 Scott and Burgan, and the Canadian models), canopy cover, canopy height, crown bulk density, and crown bulk height. Topographic data can also be downloaded.

Location: Fuels—http://www.landfire.gov/fuel.php LANDFIRE Alaska Webinar Series

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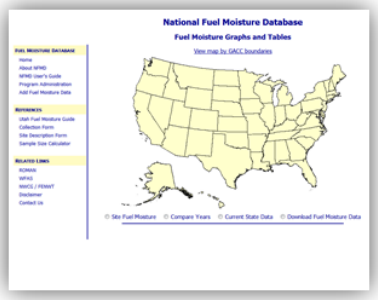

National Fuel Moisture Database

Various fuel moisture data (e.g., moss, duff, spruce, herbaceous, etc.) is now available for 7 sites in Alaska. Data can viewed by site or fuel type, displayed in a graphic or tabular format, and downloaded. This new effort to monitor seasonal moisture trends across Alaska began in 2012 and is in progress.

Location: http://72.32.186.224/nfmd/public/index.php

Contact: AWFCG—Fire Research Development and Applications Committee

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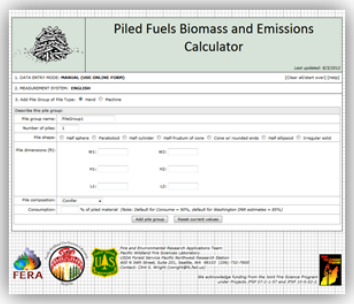


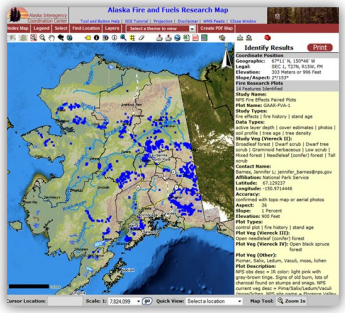
Piled Fuels Biomass and Emission Calculator

This online calculator estimates biomass for both mechanical and hand-piled fuels and smoke production. This tool can improve burn scheduling and compliance with emission limitations in smoke management plans. Outputs include pile volume (cubic feet), biomass (tons), consumed fuels (tons) and emissions by pollutant (e.g., PM, PM10, PM2.5, CO, CO2, CH4 and NMHC).

Location: http://www.fs.fed.us/pnw/fera/research/smoke/piles/index.shtml

Summary | Pile Calculator

Mapping

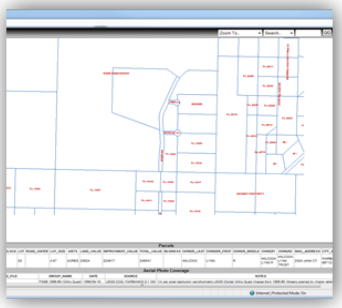


Alaska Fire & Fuels Research Map

This product provides site-level information and locations for fire effects and fuels related studies throughout Alaska in an online map interface (hosted by AICC). Display information includes study name, description, type of data collected, vegetation type, # of plots, contact name, website (if applicable), and other fields.

Location: http://afsmaps.blm.gov/imf/imf.jsp?site=firehouse

Fact Sheet | More Information



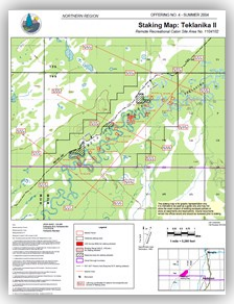
Borough Land Records

Each borough in Alaska maintains a variety of GIS products. For many of the boroughs, land ownership information can be collected.

Fairbanks-North Star: http://gis.co.fairbanks.ak.us/

Mat-Su: http://www.matsugov.us/it/interactive-mapping-services

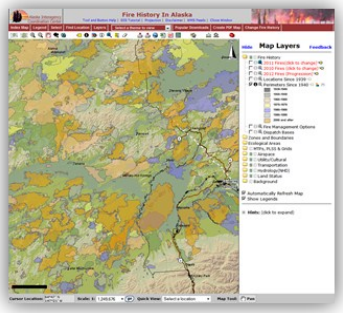
Kenai Peninsula Borough: http://www2.borough.kenai.ak.us/GISDept/



Division of Natural Resources Land Records

The Division of Mining, Land, and Water maintains a variety of land records including the Remote Recreational Cabin Sites Program, the Residential Subdivision Land offerings, and Agricultural Land offerings. This website contains maps of the areas where remote values may be located.

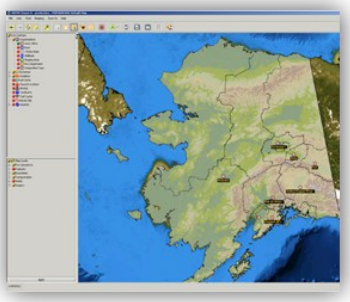
Location: http://dnr.alaska.gov/mlw/landsale/



Fire History in Alaska

The Alaska Fire History database is accessible through the AICC map interface and has two primary layers: 1) Perimeters since 1939; and 2) Locations (or points of origin) since 1940. Perimeters generally consist of only larger fires (greater than 1,000 acres) until recent years. The locations layers includes all fires. There is a multitude of options for displaying various years and fires along with exporting tabular and geospatial layers.

Location: http://afsmaps.blm.gov/imf_firehistory/imf.jsp?site=firehistory



Integrated Fire Management (IFM)

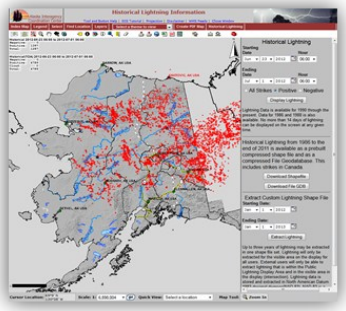
This system provides real-time situational awareness for on-going incidents. Available reports from this system include historic costs, resource use, and fire reports. Resources are displayed with current location, availability, and status.

Managers Guide to IFM (pdf)

Known Sites Database

In Alaska, site designations have been established to identify the appropriate actions to be taken within the landscape-scale management option areas. This database provides common storage of all site designations rather than individual office maps, provides a common point of communication between jurisdictional agencies and suppression agencies concerning location of sites, and provides information for statewide strategic decisions. This website is password protected.

Location: http://afsmaps.blm.gov/imf_known/imf.jsp?site=known

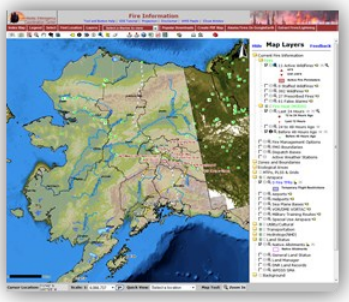


Lightning Map

The Current and Recent (last two weeks) Lightning and Historical Lightning Maps are available on the AICC map interface. A pre-built shapefile and geodatabase for historical lightning from 1986-2011 is available. There is also a custom extract option. Both current and recent and historical lightning maps have many display options.

Current & Recent Lightning: http://afsmaps.blm.gov/imf_lightning/imf.jsp?site=lightning

Historical Lightning: http://afsmaps.blm.gov/imf_customlight/imf.jsp?site=customlight



MODIS

MODIS (Moderate Resolution Imaging Spectroradiometer) provides satellite imagery including maps of wildfires, images of smoke over, infrared image maps, and hot spot locations. The hot spot locations are provided by GINA (Geographic Information Network of Alaska), UAF to the Alaska Fire Service. (AFS). AFS displays the hot spot locations on the Statewide Fire Maps.

Location: http://www.gina.alaska.edu/projects/gina-wildfire

Statewide Fire Maps: http://fire.ak.blm.gov/predsvcs/maps.php

Outlooks

Alaska 7-Day Significant Fire Potential

This 7-Day product forecasts the likelihood of large fire activity based on past fire activity and fire danger indices. Weather, fire danger, and resources summaries also provide added details on what can be expected with fire activity and resource needs over the next 7 days.

Location: http://psgeodata.fs.fed.us/7day/action/forecast/1

Alaska 7-Day Significant Fire Potential Map

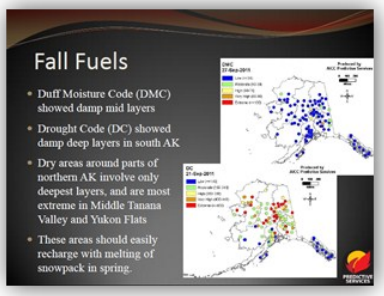
This map product geographically displays the 7-Day Significant Fire Potential forecast. The 7-Day product forecasts the likelihood of large fire activity based on past fire activity and fire danger indices.

Location: http://199.141.1.20/NPSG_alaska/staticmap.html

Alaska Monthly Fire Potential Outlook

AICC Predictive Services creates a monthly fire outlook for each month along with the following 3 month period, covering a total of 4 months. The outlook contains information on the expected fire potential and other factors related to the forecast.

Location: http://fire.ak.blm.gov/content/weather/outlooks/monthly.pdf

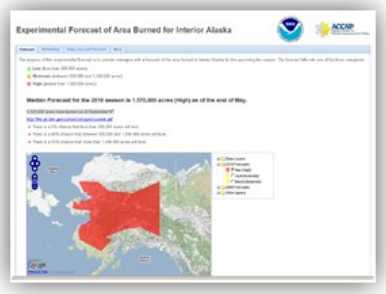


Alaska Seasonal Outlook

This product is released prior to fire season and provides a outlook that identifies areas with above normal fire potential along with information on climate indices, snow pack, fuel conditions, and other factors that contribute to fire danger. The seasonal outlook is available as a pdf and a podcast (audio with slides).

PDF: *http://fire.ak.blm.gov/content/weather/outlooks/seasonal.pdf*

Podcast: http://fire.ak.blm.gov/content/weather/camtasia/seasonal%20outlook.html



Experimental Forecast of Area Burned for Interior Alaska

This is an experimental forecast product for annual area burned that uses measurements of early season atmospheric circulation patterns to generate an estimate of area burned for the upcoming summer.

Location: http://www.snap.uaf.edu/fire_prediction_tool/

March 2011 Experimental Forecast Presentation | Oct 2011 Update [PDF] [Video]

Questions or Additions? Contact the Alaska Fire Science Consortium at http://akfireconsortium.uaf.edu or Marsha Henderson at marsha.henderson@alaska.gov.